Office Of The Director Collection, 1959-1982
19.35 cubic feet
JPL 142

History

The collection was created during the administrations of William H. Pickering and Bruce Murray as Directors of the Jet Propulsion Laboratory (JPL), and concurrently, with Charles H. Terhune as Deputy Director.

William H. Pickering was born in Wellington, New Zealand, on December 24, 1910. After one year at the University of New Zealand, he entered California Institute of Technology (Caltech) in 1929. He received his Bachelor of Science degree in Electrical Engineering in 1932, his Master of Science degree in Physics in 1933, and his Doctorate in Physics in 1936, all from Caltech. After graduation, he joined the Caltech faculty, becoming a full professor of electrical engineering in 1946. During World War II, Pickering conducted research on the absorption properties of cosmic rays with Dr. Robert A. Millikan, and investigated Japanese balloon warfare techniques for the Army Air Corps.

Pickering was invited to join the JPL in 1944, on the basis of his experience in the design and use of telemetring devices. He was named chief of the Remote Control Section at JPL. Beginning in 1949, Pickering headed the Corporal and Sergeant missile programs, and in 1954, he succeeded Louis Dunn as Laboratory Director.

In November 1957, JPL and the Army Ballistic Missile Agency were directed to prepare and orbit an artificial satellite, in the wake of the launching of Sputnik by the Soviet Union, and the failure of the American Vanguard satellite. Explorer 1, the first U.S. artificial satellite, was launched on January 31, 1958.

In December 1958, JPL was transferred to the newly created National Aeronautics and Space Administration (NASA). In January 1959, JPL was assigned the responsibility for the robotic exploration of the moon and planets. Under Pickering's direction, JPL supervised the Ranger missions returning the first close-up, high-resolution pictures of the lunar surface; he also supervised the Surveyor soft-landers on the moon; the Mariner missions to Mars and Venus; and the first gravity assist mission to Mercury, via Venus. JPL also designed the Viking Orbiters to Mars and designed and built the Voyager spacecraft for their mission to the outer planets.

After Pickering's retirement from JPL in 1976, he directed the Research Institutes of Saudi Arabia's University of Petroleum and Minerals. In 1978, he returned to California and established the Pickering Research Corporation for space related projects. In 1983, he formed Lignetics, Inc., to manufacture wood pellets from wood waste.

Pickering has received numerous national and international honors, which include the National Medal of Science, NASA's Distinguished Service Medal, the Robert H. Goddard Trophy, the British Interplanetary Society's Special Award, the Prix Galabert of France and Italy's Order of Merit. Dr. Pickering was also made an "Honorary Knight Commander of the Civil Division of the Most Excellent Order of the British Empire" by Queen Elizabeth, in 1975.

Charles H. Terhune, Jr., was born in 1916 in Dayton, Ohio. He graduated with a Bachelor's degree in Mechanical Engineering from Purdue University in 1938, and received an Aeronautical Engineering degree from Caltech in 1940.

In 1939, shortly after receiving his Army Air Corps pilot wings, he participated in early tests of bullet-proof fuel tanks for aircraft, and was associated with development of the first jet aircraft for the Army Air Force in the early 1940s. During World War II, Terhune participated in combat missions from the Philippines and Okinawa. After World War II, he served various positions involving guided missile development in the Air Force. He was promoted to brigadier general in 1959.

General Terhune retired from the armed forces with a rank of Air Force Lieutenant General in 1969. From 1969 to 1971, he was manager of administration at National Cash Register's Data Processing Division in San Diego. General Terhune was named JPL Deputy Director, assuming his duties July 19, 1971, succeeding Admiral John E. Clark.

General Terhune served as Acting Lab Director for four months after the resignation of Bruce Murray, until General Lew Allen assumed the position of Director on October 1, 1982. Terhune retired as Deputy Director of JPL in December 1983. He was awarded NASA's Distinguished Service Medal in 1982.

Bruce C. Murray was born November 30, 1931, in New York City. He earned a doctorate in Geology at Massachusetts Institute of Technology in 1955, and served as a geologist for Standard Oil from 1955-58. After serving as a Geophysicist for the U.S. Air Force, Murray joined the Caltech faculty as a Research Fellow of Planetary Science and Geology in 1960. Murray became a full Professor of Planetary Science and Geology at Caltech in 1969.

Dr. Murray was a member of the Mars Television Teams on Mariners 4, 6, 7 and 9, and was the Television Team leader for the Mariner 10 flyby of Venus and Mercury. He was named Director of JPL on June 23, 1975, officially succeeding William H. Pickering on April 1, 1976.

During his administration at JPL, the Voyager spacecraft were launched and reached Jupiter and Saturn, Seasat was launched, and the Galileo and Magellan programs were approved by Congress. Several ambitious planetary missions, called "Purple Pigeons" by Murray, such as a Jupiter Orbiter Probe, a Venus Orbital Imaging Radar, a Mars rover mission, a Lunar Polar Orbiter and a Comet Halley rendezvous were advocated by Murray. Murray also advocated the preliminary study of an interstellar probe. Most of these missions were ultimately cancelled due to lack of funding or support. Beginning in the mid-1970s, programs at JPL were increasingly concentrated in energy issues and defense.

Dr. Murray resigned as Lab Director in June 1982. He has remained active in space research. In 1979 he was a co-founder of The Planetary Society, and he became the Society's President on the death of Carl Sagan in 1997. He was a member of the scientific teams of the Russian Phobos '88 mission, the Russian Mars 96 and the U.S. Mars Global Surveyor missions, and the U.S. New Millennium Mars Microprobe Team. He has published over 120 scientific papers and authored or co-authored six books.

Provenance

The collection originated from four different shipments of records from the Office of the Director to the JPL Laboratory Records Center. These shipments, and other unrelated material, were combined into one accession when they were transferred to the JPL Archives.

Shipment 4398; [15 c.f. unprocessed]: This shipment was transferred to the JPL Laboratory Records Center from the office of S. R. Torres, Section 100, Office of the Director, on March 17, 1978. It was transferred to the JPL Archives in April 1989. There was an attempt to process the shipment in April 1991. This attempt was stopped after the partial processing of around 4.5 c.f. of material. This material has been restored to its approximate original order. One box from Shipment 4398 containing Executive Council Records has been separated into another collection.

Shipment 6131; [1 c.f. unprocessed]: This shipment was transferred to the JPL Laboratory Records Center from the office of D. Devore, Section 100, on March 23, 1981. This shipment was comprised primarily of files from Deputy Director Charles H. Terhune. It was transferred to the JPL Archives in May 1989.

Shipment 6856; [2 c.f. unprocessed]: This shipment was transferred to the JPL Laboratory Records Center from the office of Lorraine Brakebill, secretary to Deputy Director Terhune, on July 26, 1982. It was transferred to the JPL Archives in May 1989.

Shipment 3900; [2 c.f. unprocessed]: This shipment was transferred to the JPL Laboratory Records Center from the office of Esther Quesada, Section 100, on June 24, 1977. It was transferred to the JPL Archives in May 1989.

Collection Arrangement and Description

The collection is composed of documents to and from the JPL Office of the Director. The three names most mentioned are William H. Pickering, Director, 1954-1976; Charles H. Terhune, Deputy Director, 1971-1983; and Bruce C. Murray, Director, 1976-1982. The bulk of the collection is for a five-year period, from 1975 to 1980.

The collection remains as received, arranged by subject, and forms one large subject file. Some files were originally arranged by section number. These files have been re-filed by section name or appropriate subject rather than section number.

One of the first activities documented in the collection was the April 1976 retirement of William Pickering as Laboratory Director. Most prominent is a party planned by the American Institute of Aeronautics and Astronautics on April 23, 1976, a "This Is Your Life" style celebration. A NASA Headquarters reception was held on March 29, 1976. Dr. Pickering was presented with, among other items, a flag that had been to the Moon, and two packages of parts from Surveyor 3. There was a JPL Reception for Pickering at the Pasadena Conference Center on March 19, 1976, and a JPL Dinner on March 26, 1976. Also documented is the NASA celebration of Dr. Pickering's retirement in April 1976.

Starting in 1976, JPL became smaller and redefined its direction of development, primarily due to changes in funding and NASA policies. Bruce Murray, the new Lab Director in April 1976, sought different projects for JPL, such as high-tech military research and energy programs. But Murray also advocated new and ambitious planetary exploration missions.

Murray was named to succeed Pickering a year earlier, in April 1975. He had never managed any organization comparable to the size of JPL. During a year-long sabbatical from Caltech, he was given numerous briefings on the institutional background of the Lab as a whole as well as the different Lab offices and divisions. These institutional briefings are represented in the collection with congratulatory letters Murray received after becoming Laboratory Director, as well as several unsolicited letters of advice from members of the general public.

Throughout the 1980s, energy and defense work became high priorities for JPL. JPL had been involved in small-scale energy programs before Murray's tenure as Laboratory Director. In 1976, the Energy Research Development Administration (ERDA) became a substantial source of JPL's income aside from space exploration. JPL primarily focused on researching low cost solar energy. But President Carter eliminated ERDA soon after entering office in 1977, later resurrecting it as the Department of Energy.

JPL's involvement in energy programs included the study of fuel-efficient automobiles, known as "clean cars," with Caltech's Environmental Quality Laboratory and JPL personnel such as Mahlon Easterling. JPL was also involved with studies of treatment of nuclear waste and aspects of solar energy. In 1978, the Department of Energy designated the Solar Energy Research Institute (SERI) of ERDA as the lead center for photovoltaic research and development with JPL designated as the lead center for photovoltaic technology. The JPL Low-Cost Silicon Solar Array Project, documented in the collection, was part of the ERDA photovoltaic conversion program. SERI is represented in the collection with correspondence, published reports, draft reports, interoffice memoranda, proposals and presentations.

JPL had previously assisted the military. In the late 1970's it renewed such contracts. Two projects that are represented in the collection involving JPL and the military were TACOM and MX-RES.

The U.S. Army Tank-Automotive Command (TACOM) planned to establish an Advanced Concepts Laboratory (ACL) under JPL supervision. After protracted negotiations and study, it was decided that JPL would not respond to the Army Request For Proposal. It was ultimately thought that it would be better policy for JPL to perform work for the Army by unsolicited invitation rather than by response to an RFP, and be in competition with industry. Management of the project also would have posed many logistical problems for JPL as well.

JPL acted as system support for the Department of Defense (DOD) and Department of Energy (DOE) on the MX-RES Project beginning in the late 1970s. Project objectives were to provide reliable power for the MX missile system (DOD) and to accelerate the commercial application of renewable energy systems technology (DOE).

In the early period of Murray's administration, there was concern that there would be a major reduction of JPL flight project personnel, resulting in an anticipated five hundred layoffs in January 1978. No new projects had started since the initiation of the Mariner Jupiter/Saturn '77 project. The consequences of such a layoff would be to potentially lose a unique and extremely valuable national asset. JPL would experience a shortage of skilled employees as engineers and technicians took jobs in private industry. In late 1976, a NASA Five-Year Plan included two projects to be started in October 1978: Jupiter Orbiter Probe '82

and Lunar Polar Orbiter '80. NASA also approved funds for JPL to study and prepare for a mission to Halley's Comet as well as a follow-up of the Viking Project to Mars. JPL also began looking at different technologies, such as Solar Sailing, or Solar Electric Propulsion, also known as Ion Power. Together these new projects prevented the potential layoff situation.

In July 1976, a major restructuring of the divisions at JPL occurred, due in part to the anticipated manpower and project cutbacks. The total number of Assistant Laboratory Directors (ALDs) and independent offices reporting to the Director's Office was reduced from 17 to 10. This reorganizing is documented in the collection. All technical divisions and the DSN Operations Organization were brought under a single ALD for Technical Divisions. A Technology and Space Program Development Office and working group were established. Twenty-two administrative divisions were consolidated to 17, and placed under one ALD for Administrative Divisions.

Bruce Murray has described his first year as Laboratory Director as a "learning experience." In April 1976 the Lab was evacuated in response to two bomb threats. An outcropping of bedrock was discovered signaling a possible earthquake fault directly under JPL buildings. There was also growing agitation that minorities and women were under-represented in employment at the lab.

All of these problems are addressed in the collection, the most serious concern about equal opportunity. In 1976, the Federal Affirmative Action Office challenged JPL with hiring too few members of minority groups. This problem was addressed gradually, with some friction.

There was an effort to have more constructive interaction between the Lab and Caltech as well. In July 1975, Caltech President Harold Brown and Director William Pickering appointed a joint Lab-Campus committee, headed by Professor R. E. Vogt and JPL'er Jack N. James, to investigate the interaction between JPL and Caltech. Draft and working copies, and Part 1 of the published report of the Vogt Committee are in the collection.

The JPL Advisory Council was created in April 1976. Members of the council were jointly appointed by Caltech President Harold Brown and Murray for the purpose of expanding JPL's views of industry, university and government outside of NASA. The Advisory Council had no line responsibility nor did it make policy, but acted as an advisor to Murray. The Advisory Council was comprised of around twenty individuals, half representing Caltech and half representing other universities or industry. Several members also served on the JPL Executive Council or on the Caltech Board of Trustees. The files contain correspondence regarding serving on the Advisory Council, what was discussed at meetings, agendas, short biographies of members, and membership lists.

Documents regarding the JPL Senior Staff are also in the collection. The JPL Senior Staff was instituted in 1959 in order to provide for better communication between the Office of the Director and the key elements of the Laboratory. In 1959 the Senior Staff consisted of 28 members. This number gradually increased until it reached 83 in October 1971. Then it was reduced to around 40 by 1973. Appointed by the Director, the Senior Staff conducted the upper management functions of the Laboratory. Represented in the collection are correspondence, background memoranda, and membership lists. Although its composition varied from one time to another. In 1975, it was composed of the Director, Deputy Director, the Assistant Laboratory Directors and their Deputies, the heads of major offices, Project Managers, and Division Managers.

Also represented in the collection are weekly significant event reports from Assistant Laboratory Directors and other managers who reported directly to the Laboratory Director. These reports are organized alphabetically by division. The folder titles also note the individuals who filed the reports.

Two methods of assessing internal goals and principles are present in the collection. The JPL Five-Year Plan was an internal working document designed to record and communicate important principles, intentions, objectives, policies, guidelines, and decisions which collectively expressed what the Laboratory was doing, its future intentions, and the actions needed to be done to accomplish its objectives. Another way of formulating and disseminating goals were the Futures Studies. The purpose of a JPL Futures Study was to provide the Director with an assessment of the programmatic and institutional alternatives for JPL that were consistent with its internal goals and with national priorities and circumstances. A few years earlier NASA conducted an "Outlook for Space" study, which looked into civilian space activities as they might develop

over the next twenty-five years and assessed their potential interaction with national needs and goals. While a final report is not represented in the collection, a synopsis is, as well as an analysis of the conclusions of the report would have on JPL.

There was much concern that there was no effective space policy being conducted by NASA, and programmatic decisions were being made without any cohesive basis. This is reflected in correspondence from Donald G. Rea and Nicholas Renzetti, and in testimony before Congress by Thomas A. Mutch, Associate Administrator of NASA's Office of Space Science. NASA was preoccupied with development of the Space Shuttle and defense work, and there was little, if any, financing for robotic missions and space science. The inability of getting approval for a Halley's Comet mission was symptomatic of this lassitude that many believed permeated NASA. Ironically enough, this feeling became especially intense at the very moment of JPL's finest triumph, the Voyager encounters with Jupiter in 1979.

JPL was also concerned about gaps in activity. Following the Voyager 2 encounter at Saturn in August 1981 there would be at least a 44-month period before Galileo encountered Jupiter, planned for mid 1985. There were Voyager 2 encounters with Uranus in January 1986 and Neptune in August 1989. However, after the launching of Pioneer Venus in May 1978, there was an eleven-year gap until the Magellan launching in May 1989. These gaps were aggravated by NASA's over-reliance on the Space Shuttle as a launch vehicle. NASA's initial plan was to phase out, then stop entirely, expendable launch vehicles in favor of deployment via the Space Shuttle, aided by an Inertial Upper Stage (IUS) to boost the payload out of low Earth orbit. This policy was reversed shortly after the Challenger disaster in 1986.

The NASA Fiscal Year 1980 budget was especially viewed as being hard on JPL and robotic exploration. The Space Shuttle was given full funding, but JPL's Venus Orbital Imaging Radar mission was delayed for a year, placing it in competition for funds with the Halley's Comet mission in the FY 1981 budget.

In the spring of 1976, Bruce Murray initiated a "Purple Pigeon" study of possible future missions for JPL, dramatic missions of high scientific content that would garner public support. "Purple Pigeons" were contrasted with "Gray Mice," missions of scientific interest only to a few scientific disciplines but so dull they would never gain widespread public support. Murray believed new projects would have to include pizzazz to attract public support.

There are several files that illustrate long-range planning and programming. Documents about space colonization and orbital space stations are present in the collection. There is one file about a "Space Operations Center." This concept would involve a permanent manned facility in low earth orbit, dedicated to the development and use of space construction techniques, and to the servicing of space vehicles including assembly, launch, refueling, and re-use. It is represented in the collection by a letter from Christopher Kraft, director of Johnson Space Center, and a short response from Bruce Murray. One file entitled "Very Long Range Planning" is comprised of a memorandum dated February 1979, and is a product similar to those later done for Murray's think tank that followed Purple Pigeons called the "Noodle Factory" which conducted long-range studies for JPL in mid-1979, which is documented elsewhere.

Bruce Murray's vision of a robust, dynamic program of space exploration exemplified in his "Purple Pigeons" concept was implicit in several programs he advocated throughout the first half of his tenure as laboratory director. "Project Columbus" was one such program. Project Columbus was to be a single project embracing a new mission a year to complete the reconnaissance and exploration of the Solar System by the end of the century, specifically by 1992, the 500th anniversary of Columbus' discovery of the New World. The representative missions included a Mercury Orbiter, Venus Orbiting Infrared Radar, Lunar Polar Orbiter, Mars Polar Orbiter and Probe, Asteroid Surveyor, Jupiter Orbiter Probe, Saturn Uranus Probe, Jupiter Neptune Probe, and a Jupiter Pluto mission. Project Columbus was led by Louis D. Friedman, who initially went directly to the Office of Management and Budget rather than NASA to promote the idea. Project Columbus began and ultimately ended in 1976, although the VOIR and JOP missions continued on, under other names.

Project Columbus was similar to the advocacy study, "Technology for Exploration of the Solar System," written in September 1976. This study advocated the complete reconnaissance of the solar system by the end of the 20th century. The program included missions of reconnaissance, exploration and intensive

study. This program proved to be too ambitious for many, and only two of the nineteen planned missions actually flew. A report prepared for the Summer 1976 meeting of the Committee on Planetary and Lunar Exploration (COMPLEX) also contains information regarding many "Purple Pigeon" missions.

It is similar to the Lunar and Planetary Mission Handbook, dated May 1979. The report covers missions to the Inner Planets such as the Venus Orbiting Imaging Radar, Lunar Polar Orbiter, 1986 Mars Aeroscience/Geoscience Orbiter, Mercury Orbiter, Mars Sample Return, and Venus Lander/Balloon. Outer Planets missions covered include Voyager, Galileo, Saturn Orbiter Dual Probe, Jupiter Orbiter Satellite Tour/Lander, Uranus Orbiter/Probe, Jupiter/Pluto Flyby, and Jupiter/Neptune Flyby. Missions to "small bodies" include Halley Flyby/Tempel 2 Rendezvous, Asteroid Multiple Rendezvous, Comet Sample Return and Asteroid Sample Return. The missions covered in both reports are similar to those under the earlier "Project Columbus."

A June 1980 report to the European Space Symposium written by ALD Jack N. James titled "The Planetary Exploration Program After Two Decades," was more a strategic plan for the years 1980-2000 than a detailed examination of what had happened earlier. James discussed approved missions, such as Voyager, Galileo, and the International Solar Polar Mission. James sketched out a Halley Intercept Mission in 1985, a Venus Orbiting Imaging Radar in 1986, Comet Rendezvous mission in 1987, a Solar Probe in 1988, a Saturn Orbiter with Probes in 1989 and a Mars surface explorer and sample return in 1990.

The Galileo Project is well-represented in the collection. Galileo began as the Jupiter Orbiter Probe (JOP) at NASA-Ames, a follow-up to their Pioneer 10 and 11 probes. In the fall of 1975, NASA transferred the JOP Project over to JPL. JOP began development in 1977, and was renamed Galileo in January 1978. Project Manager from 1977-89 was John R. Casani. The question of congressional support for JOP came to a head in July 1977. In June 1977 the House Appropriations Committee turned down the mission, but it was approved by the Senate Appropriations Committee. The vote then went to the floor of the House, where in July 1977 it was approved 280-131.

Galileo was planned to be the first planetary mission to utilize the Space Shuttle/Inertial Upper Stage (IUS) launch vehicle. The mission was originally intended to be launched in January 1981, with a Mars flyby in April 1982. This launch was postponed in September 1979 to a 1984 launch due to IUS construction delays.

In January 1981, when it was apparent that the IUS would not be available for a 1984 launch, Galileo was again postponed, to a May 1986 launch aboard STS 61-G. The frustration at JPL over the continued postponement of Galileo is evident in correspondence from Bruce Murray to NASA Administrator James M. Beggs in February 1982. Murray stated that the project had been made vulnerable due to the various program changes. "The project had had to redo spacecraft designs and implementation plans, redirect contractors, redeploy people and generally reeducate and remotivate many people and organizations toward new plans and goals on three major occasions." Murray stated that a NASA Centaur, in development in 1982, could be used very effectively in launching Galileo in 1986. There would be potential problems with the ISPM, also scheduled for a 1986 launch. Murray proposed a 1985 ISPM launch using the Shuttle/IUS booster, if the Centaur option was to be considered for Galileo.

The May 1986 launch of Galileo was postponed further with the Challenger disaster in January 1986. Galileo was finally launched in October 1989 aboard STS-34. The spacecraft was forced to use a Venus-Earth-Earth gravity assist trajectory, ultimately reaching Jupiter in 1995.

A mission to Halley's Comet in 1985-86 was of extreme importance to JPL. A Halley Rendezvous mission was presented to NASA management in September 1976. It was undecided what type of propulsion would be used. Two advanced forms were considered, solar sail technology or solar electric propulsion (SEP), also known as "ion power." JPL primarily advocated solar sails, but many of the upper NASA management advocated SEP. This collection groups all solar sail and SEP materials with the rest of the materials documenting the Halley's comet missions, as the two technologies were strongly linked to a planned Halley mission.

A launch was planned in January 1982, with rendezvous in March 1986. Program Leader for the Solar Sail aspect was Louis D. Friedman, and for the Solar Electric Propulsion aspect was K. L. Atkins. Project Scientist for the Comet Mission was Marcia Neugebauer. The Halley mission was to have an

October 1981 launch. The mission never received widespread institutional support from NASA, and was dropped in September 1977.

In 1978, a Halley rendezvous mission was revived with the European Space Agency. The Halley Flyby/Tempel 2 Rendezvous would be comprised of an ESA-built probe and a SEP powered spaceship, built by JPL. The Halley/Tempel 2 mission was killed by the Office of Management and Budget in November 1979.

A third effort, the Halley Intercept Mission, was initiated in 1980, but did not receive any support for funding. It was officially terminated in 1981. The Comet Rendezvous Project was created in 1979, and had an extremely long gestation period, eventually becoming known as Comet Rendezvous Asteroid Flyby (CRAF) and tacked on to the Cassini probe to Saturn. The mission was known as CRAF/Cassini, before the CRAF portion was cancelled in the early 1990s.

The Shuttle flight STS-51L, aboard the Shuttle Challenger, was to have carried a small Halley's Comet Experiment, to measure the comet's composition and activity. However, the Challenger exploded 73 seconds after take-off on January 28, 1986. The Soviet Union, Japan and the European Space Agency all launched missions to study Halley's Comet. The United States failed to take advantage of an opportunity that occurs once in 76 years. The U.S. did convert an old satellite that studied the Earth's magnetic field and the solar wind, the International Sun-Earth Explorer-3 (ISEE-3) into a comet probe, the International Cometary Explorer (ICE). ICE passed by Comet Giacobini-Zinner in September 1985, and did return scientific data, but the probe had no cameras. ISEE-3 (or C) was an international project between NASA and ESA, and launched from Cape Canaveral in August 1978.

Represented in the collection are documents involving the Infrared Astronomical Satellite (IRAS). IRAS was originally authorized in 1976 as a joint U.S./Netherlands project, with launch in 1981 for a complete infrared sky survey. The project was transferred from Goddard Space Flight Center to JPL in April 1976. Ames Research Center was responsible for the infrared experiment and telescope study support. Project Manager at JPL was initially E. Kane Casani. The IRAS bus was designed and built in the Netherlands under management of the Dutch Space Agency. IRAS was launched in January 1983.

There is much documentation in the collection regarding the International Solar Polar Mission (ISPM). The ISPM began as the Out of the Ecliptic Program, a joint program between NASA and the European Space Agency (ESA). The original plan was to launch two spacecraft simultaneously. The spacecraft would swing by Jupiter, one traveling north of the ecliptic, going over the solar north pole, the other traveling south of the ecliptic, going over the solar south pole. This mission was renamed the International Solar Polar Mission in the late 1970s.

The US ISPM probe was cancelled in May 1980 when it received no funding in NASA's FY 1982 budget. The House Subcommittee on HUD- Independent Agencies voted to rescind all funding to ISPM, with instructions to terminate the program. This action was protested by the Department of State, who felt that the complete cancellation of the project would have immediate adverse impact on the future relationship with ESA, and was contrary to the long-term commercial and foreign policy interests of the United States. Presidential Science Advisor Frank Press concurred with the State Department. However, unlike JOP, the American-designed ISPM probe was cancelled.

The remaining probe was designed by ESA, with half the payload comprised of JPL-run science experiments. The original planned 1983 launch had earlier been pulled back to a 1985 launch, and was further postponed to a May 1986 launch aboard the Shuttle Challenger. ISPM was renamed Ulysses in September 1984. Ulysses was to have been deployed on STS-61F in May 1986, but this mission was cancelled after the Challenger explosion in January 1986. Ulysses was ultimately launched aboard STS-41 in October 1990.

The documents regarding the ISPM in the collection show the amount of lobbying by Deputy Director Terhune to members of Congress, and devising strategies to show support for the mission by Tim Mutch of NASA, as well as lobbying efforts by California Governor Jerry Brown and Congressman Don Fuqua. The file includes handwritten notes by Terhune documenting his actions.

Another project that was cancelled and never flown that is documented in the collection is the Lunar Polar Orbiter (LPO). Objectives of the LPO were to prepare topographic, geochemical and particle and field

maps of the Moon. The LPO was to be a dual spacecraft mission, with a lunar polar orbiter and a relay orbiter. It originated at the Goddard Space Flight Center, and transferred to JPL in October 1975. The NASA Office of Space Science selected a LPO Science Working Team in June 1976. By late June 1976 there was a payload of eight science experiments selected for the LPO, which was now called the Terrestrial Bodies Orbiter- Lunar. However, the LPO was not included in the FY 1978 NASA budget. A 5-Year Plan report on the exploration of the solar system written in 1977 refers to the LPO as the Lunar Resources Satellite. The mission was re-submitted for the FY 1979 budget, but was shelved when it was apparent there was no institutional support. The LPO was to originally have a September 1980 launch, which was later postponed to March 1984 before the project was dropped.

JPL's role in Project Viking is documented more thoroughly elsewhere, although the project is represented in the collection. Langley Research Center managed Viking. JPL designed and built the two Viking Orbiters, conducted mission communications using the Deep Space Network, and was the command center for the mission. The two Viking spacecraft were launched in August and September 1975, and arrived at Mars in July and September 1976. Management was transferred from Langley to JPL in April 1978. The Viking 2 Orbiter ceased operations on July 25, 1978, due to a leak in the propulsion system. The Viking 2 Lander was apparently inadvertently turned off on February 1, 1980. The Viking Orbiter 1 mission was successfully completed on August 7, 1980, and the Viking Project Office at JPL was closed on September 30, 1980.

JPL attempted a follow-up to the Viking missions to Mars, with a Mars 1984 mission. A Mars Science Working Group was established in January 1977. Thomas Mutch of Brown University was the Working Group Chairman, and Geoffrey Briggs of JPL was named Program Scientist. This mission was to be a dual launch to Mars in 1984 employing orbiters that would launch penetrators to the surface and then deploy roving vehicles on the surface to explore. The Mars '84 Mission was to be launched from the 75th flight of the Space Shuttle, scheduled in the last half of 1983. Additionally, the roving mission would potentially be able to bring back large samples of the Martian surface to laboratories in Earth orbit for analysis. The Mars Rover mission was named "Columbus" in 1977. The mission was postponed to 1986 before being cancelled.

The JPL Long Range Plan of 1979, found in the collection, noted a Mars Sample Return mission. The Lunar and Planetary Mission Handbook of May 1979 described a 1986 Mars Aeroscience/Geoscience Orbiter as well as a Mars Sample Return mission with a launch date of August 1990.

The Search for Extraterrestrial Intelligence (SETI) had Murray's enthusiastic support. SETI had its origins in theory in 1959 with a paper written by physicists Philip Morrison and Giuseppe Cocconi, and in practice in 1960 with Project Ozma, managed by Frank Drake. SETI used radio telescopes to search for extraterrestrial intelligence. NASA began to fund SETI in the early 1970s but the program was always in a precarious position, and was attacked by Senator William Proxmire in 1978 with his "Golden Fleece Award." It lost federal funding in the early 1990s, but continued with private funding.

Represented in the collection are correspondence, generally regarding SETI meetings and lobbying with Congress to continue funding, as well as a file on Senator Proxmire's criticisms of the program. Various reports, workshops, and articles regarding SETI are also in the collection.

Also represented in the collection is documentation regarding Seasat. Seasat-A, as it was known then, started in the fall of 1974 at JPL. It was to monitor global oceanographic phenomena. It originated at Goddard Space Flight Center, but was transferred over to JPL when the project ran into cost overruns. It was launched on June 26, 1978 from Vandenberg Air Force Base. After 106 days of flight the satellite power subsystem suffered a catastrophic failure. Despite this failure, the on-orbit performance of the spacecraft either met or exceeded the pre-launch expectations. However, in its Performance Evaluation for Fiscal Year 1978, NASA was critical of JPL's role in Seasat, noting the cost overrun and financial management, as well as the catastrophic failure of the spacecraft itself. JPL in turn thought NASA's use of the word "failure" was judgmental since Seasat accomplished its primary objective, the demonstration of techniques for global monitoring of oceanographic phenomena and features, and should be identified as a satellite failure, not a mission failure.

The collection includes miscellaneous correspondence regarding the transfer of Seasat from GSFC to JPL as well as some controversy between JPL and the Department of Defense regarding the altimetry experiments. The DOD thought that Seasat might be powerful enough to detect submarines, and wanted the instruments either degraded or classified. Two file folders with information on the Seasat support instrumentation are also a part of the collection. A review of the Seasat failure review board is also present.

Another high-prestige project was the Hubble Space Telescope. JPL was involved in two activities in support of the Space Telescope, the Wide Field/Planetary Camera (WF/PC) and a backup Fine Guidance System (FGS).

Another major planetary mission that was formulated originally in the 1970s was the Venus Orbiting Imaging Radar (VOIR). Delays in launch dates and false starts doomed it as a project until it was replaced by the Venus Radar Mapper (VRM), later re-named Magellan Project, which was also delayed until it launched in May 1989 aboard STS-30. Magellan was the first planetary mission to be launched from the Space Shuttle.

The most critical and important mission for JPL during these times was that of the Voyager Project to visit the outer planets of the solar system and beyond. The goals and key dates of the mission have been related elsewhere. Represented in the collection is information regarding forerunner Voyager missions as well as lists of alternate names for the Voyager project. A correspondence file includes memoranda about various aspects of Voyager, as well as congratulatory letters from various people.

There are many documents in the collection documenting JPL's interactions with Congress. Important Congressmen and Senators that are prominently featured in the collection are:

Don Fuqua, US House (D-FLA)

Fuqua was chairman of the House Committee on Science and Technology and Chairman of the Space Sciences and Applications Subcommittee. He was usually supportive of the space program. Fuqua succeeded Olin Teague (D-TX) as Chairman of the House Committee on Science and Technology in 1977.

Edward Boland, US House (D-MA)

Boland was chairman of the House Appropriations Subcommittee on HUD and Independent Agencies, and was not a supporter of the space program. He came out vocally against continued funding of the Jupiter Orbiter Probe in 1977. Boland became well-known during the 1980s for the "Boland Amendment" banning Presidential aid and support to the Nicaraguan contras.

Harrison H. ("Jack") Schmitt, US Senate, (R-NM)

Schmitt was a former astronaut, and as a geologist was the only trained scientist to go the Moon, aboard Apollo 17. He served as NASA Assistant Administrator for the Office of Energy Programs before being elected to the Senate in 1976. He was naturally favorable towards NASA. Schmitt was defeated for re-election in 1982.

William Proxmire, US Senate (D-WI)

Proxmire served on the Senate Committee on Appropriations, and was chairman of the Senate Appropriations Subcommittee on HUD and Independent Agencies. He was a longtime critic of the space program, and known for his "Golden Fleece" awards highlighting misuse of government funds.

Strom Thurmond, US Senate (R-SC)

Thurmond, a political reactionary on many social issues, was a vocal supporter of NASA and such projects as Galileo and the Halley's Comet probe.

Also represented in the collection is correspondence from noteworthy people, associated with both JPL and NASA. They include:

James Fletcher, NASA Administrator, 1971-77 and 1986-89.

Robert Frosch, NASA Administrator, 1977-81.

Anthony J. Calio, NASA Associate Administrator for Space and Terrestrial Applications.

Noel W. Hinners, NASA Associate Administrator for Space Science, to September 1979; Director, National Air and Space Museum, 1979-82; Director, NASA-Goddard Flight Research Center, 1982-87; presently he is vice president for flight systems at Lockheed Martin Space Systems.

Hans Mark, Director, NASA-Ames Research Center 1969-77; Deputy Secretary of the Air Force, 1977-79; Secretary of the Air Force, 1979-81; NASA Deputy Administrator, 1981-84.

Harold Brown, Secretary of the Air Force, 1965-69; President, Caltech, 1969-77; Secretary of Defense, 1977-81.

Marvin L. ("Murph") Goldberger, President, Caltech, beginning 1977.

Frank Press, Science Advisor to President Carter, 1977-81.

Angelo Gustaferro, Director, NASA Planetary Division, beginning 1979.

Thomas ("Tim") Mutch, Geologist, Brown University; Key geologist Viking Landers; NASA Associate Administrator for Space Science, September 1979-October 1980.

Elmer S. ("Todd") Groo, NASA Associate Administrator for Center Operations, to 1976.

Alan M. Lovelace, Associate Administrator, NASA Office of Aeronautics and Space Technology, 1974-1976; NASA Deputy Administrator, 1976-1981; Corporate Vice President, General Dynamics Corporation, beginning 1981.

William C. Schneider, NASA Associate Administrator, Space Tracking and Data Systems.

JPL employees featured prominently in the correspondence are, apart from the ALDs and others mentioned earlier:

Lorraine Brakebill, Mary Lyle, Helen Benedict, secretaries in the Office of the Director

Arden Albee, JPL Chief Scientist

Donald R. Fowler, Caltech/JPL General Counsel

Victoria L. Melikan, Legislative Affairs and Protocol Manager (Section 184).

There is an abundance of material regarding NASA-JPL relations in the collection. Correspondence from 1975 to 1978 regarding meetings of NASA Center Directors is present in the collection, as well as documentation of relations between JPL and other NASA Centers, which includes agendas, schedules, minutes, and handwritten notes. Another instance of the relationships between the NASA Centers can be found in the Roles and Missions files, with a catalog of NASA Center roles, dated April 1976. Also represented in the NASA documents are reports from the JPL Liaison at NASA Headquarters, William H. Petit, Jr. These reports illustrate the general mood around NASA HQ in Washington, D.C. Also of note in the collection is a series of interoffice memoranda about events in the space program of the Soviet Union. This series of documents were informally collected by J. R. Bruman of Section 201, Planning Office, and originally distributed to Robert Parks in 1976. Also included is a six-page memo entitled "A Guide to Data on the Soviet Space Program."

There are three folders documenting NASA Management Issuances (NMIs). These documents describe an issuance coming from NASA headquarters, the reviewing NASA offices, and any special management instructions. The subject of many NMIs were more procedural than programmatic, such as the selection of payload specialists for non-NASA sponsored Space Transportation System missions, or the approval, production and distribution of motion picture, television and radio productions generated by NASA.

Another means of NASA disseminating directives is the Program Operating Plan (POP), which served as an operating plan to evaluate accomplishments and provide funding but also used as the basis to formulate future budget estimates by NASA. The collection has six folders of POPs from 1976 to 1980.

Another means of making new assignments were the Research and Technology Operations and Plans (RTOP) forms. The forms define the title of the project, the responsible NASA organization, the status of the RTOP, and a brief technical summary of the project, sketching out the objectives and approach. The collection includes six files of RTOPs, encompassing such projects as Spacelab experiments aboard the Shuttle, SETI experiments, alternate fuel experiments, high power laser systems, and medical image processing instruments. Also represented are the memoranda documenting approval and funding of RTOPs.

Included in the collection are several files of Work Authorization Documents (WADs). The WAD acted as a guide in budget preparation. The vast majority of the WADs in the collection are involved with Tracking and Data Acquisition, primarily the Deep Space Network.

Another source of funding was that of the Director's Discretionary Fund (DDF). The DDF was established by a Memorandum of Understanding dated December 1968. NASA furnished $550,000 per year. The DDF provided support for independent research and development at JPL in new fields of science and engineering. Support from the Fund requires the Director's approval. The DDF Advisory Committee,

composed of one Campus and five JPL members, assisted the Director in screening proposals and preparing recommendations.

The relationship of various NASA offices to JPL is documented in the collection. One example is the NASA Pasadena Office (NaPO), which was disestablished in March 1976, and replaced by two resident offices, the NASA Resident Legal Office-JPL and the NASA Resident Procurement Office-JPL (NRPO). Additionally, on occasion, a JPL employee would be "loaned out" or detailed to another organization within NASA. This is documented in the collection. Performance evaluations of JPL as a whole by NASA from 1974 to 1980 are also represented in the collection.

The rivalry between the various NASA Centers might be illustrated with the Extreme Ultraviolet Explorer (EUVE) Mission. Documented in the collection is an October 1980 meeting where Tom Young, Director of Goddard Space Flight Center, mentioned the possibility of Goddard being assigned the EUVE mission, a mission that had been provisionally assigned to JPL. EUVE was eventually assigned to GSFC, and was launched in June 1992. Its mission was to make observations in the ultraviolet and x-ray bands. EUVE science and data management effort was focused at the Center for EUV Astrophysics of the University of California, Berkeley, under the leadership of Dr. Roger Malina, the son of JPL co-founder Frank Malina.

Frank Malina himself is represented in the collection with two letters, written by Bruce Murray. The first letter, dated November 1976, is one of Murray thanking Malina for sending him his three "memoirs" of the early days of JPL. The second letter, written by Murray to Roger Malina in March 1982, four months after Frank Malina's death, requests that Malina's papers be housed at Caltech. Malina's papers were eventually donated to the Library of Congress, with microfiche copies given to Caltech and JPL.

Documented in the collection are the various proposals of civil projects that JPL was involved with. These proposals are so numerous that they were originally filed alphabetically in several files. This filing system has been retained, with selected projects, such as Jupiter Orbiter Probe or VOIR being filed with other similar project documents.

Deputy Director General Charles H. Terhune is represented in the collection with his appointment books from 1979 and 1980, handwritten notes, and his correspondence file with other handwritten notes also scattered throughout the collection, most notably in the lobbying efforts on behalf of the International Solar Polar Mission.

Represented in the collection are several memoranda and reports detailing the writing of two scholarly books dealing with JPL. The JPL History Office was established in 1967 by William Pickering and the Division of Humanities and Social Sciences of Caltech. The principle purpose was to research and publish scholarly histories of selected projects conducted by JPL. The first history was to be Project Ranger. The project was researched and written by Cargill Hall. The publishing of the Ranger history was held for one year due to budgetary problems. It was eventually published in 1977 as *Lunar Impact: A History of Project Ranger*, as part of the NASA History Series.

In 1973, an institutional history of JPL was planned. The Caltech Humanities Division chose Dr. Clayton Koppes to write the history, under supervision of Caltech Professor Daniel Kevles. Kevles also served as editor of the Ranger history. The contract for the JPL history was initially three years. In 1976, a 15 month extension was requested. NASA wanted the manuscript published by the Government Publishing Office, while JPL and Caltech preferred a university press. Koppes eventually completed the manuscript in 1979 on his own time. It was published in 1982 by Yale University Press as *JPL and the American Space Program*.

There is one flat box containing oversize items. These items include a floor plan to the Directors Office, the patent specifications for a power plant, and the Voyager 2 Encounter Science Sequence, a series of charts showing the sequence of events of Voyager 2's encounters with Jupiter.

There are two boxes of materials stamped or marked "JPL Discreet." Their original positions in the collection have been marked with a separation sheets.

Conservation/Preservation

Standard preparations of documents for long term storage were completed.

Separation Statement

The original accession (89-11) was split up into seven separate collections: Office of the Director Collection (this collection), JPL Executive Council Collection, Defense Project Collection, DSN Radio Science Collection, Mariner Mars 1969 Reliability and Quality Assurance Document Collection, MJS 77 Configuration Collection, and the Optical Image Enhancement Feasibility Study Collection.

Finding Aids

No other finding aids exist for the collection.

FILE FOLDER LIST

By subject

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Fld. 1 Active Cavity Radiometer Intensity Measurement (ACRIM), 1977.
Fld. 2 Administrative Divisions, Section 600, 1976-1979. [folder 1 of 2]
Fld. 3 [folder 2 of 2]
Fld. 4 Administrative Divisions- An Organizational and Functional Synopsis of Operations, c. 1976 [binder]
Fld. 5 Advanced Technology for Large Area Space Systems (ATLASS), 1977.
Fld. 6 JPL Advisory Council, 1976-1979.
Fld. 7 Advocacy, 1976-1979.
Fld. 8 Advisory Council for Women, 1979-1980.
Fld. 9 Aerosol Monitoring, 1977.
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Fld. 11 Air-Sea Interaction Workshop, 1979.
Fld. 12 Albee, Arden, 1979.
Fld. 13 Alternative Consumer Energy Society (ACES), 1975-1977.
Fld. 14 Alternative Technology, 1979.
Fld. 15 American Academy of Arts and Sciences (AAAS), 1976-1979.
Fld. 16 AAAS meeting at JPL, December 3, 1976.
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Fld. 18 American Institute of Aeronautics and Astronautics (AIAA), 1976-1979.

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Fld. 19 American Institute of Physics, 1976.
Fld. 20 American National Standards Institute (ANSI), Subcommittee on Photovoltaics, 1979.
Fld. 21 Applied Mechanics Division, Section 350, 1977-1979.
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Fld. 37 Audits, Caltech, 1975-1979.
Fld. 38 Audits, Defense Contract Auditing Agency (DCAA), 1975.

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Fld. 41 Audits, General Accounting Office (GAO), January-February 1975.
Fld. 42 Audits, GAO, March-June 1975.
Fld. 43 Audits, GAO, July-December 1975.
Fld. 44 Audits, GAO, 1976-1977 [folder 1 of 2]
Fld. 45 [folder 2 of 2]
Fld. 46 Audits, GAO, 1978-1979.

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Fld. 47 Audit, GAO Study of Land Satellite Project, January 1976.
Fld. 48 Audit, GAO Study of Space Telescope Project, January 1976.
Fld. 49 Audit, GAO Study of Seasat Project, February 25, 1976.
Fld. 50 Audit, GAO Survey of Geothermal Energy Program, March 1977.
Fld. 51 Audit, Quality Assurance and Reliability Office, 1979.
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Fld. 53 [folder 2 of 2]
Fld. 54 ADP, "Software Development at JPL," David Rose, November 10, 1976.
Fld. 55 ADPE Acquisition Plans, 1979-1980.
Fld. 56 Automobile Power Systems Evaluation Study (APSES), "Clean Car," 1975-1977.
Fld. 57 Automobile Power Systems Evaluation, Vol. 1 Summary, "Should We Have a New Engine?" c. 1976.
Fld. 58 Autonomous Systems Research and Development Program, 1980.
Fld. 59 Awards- NASA/JPL, 1976-1979. [folder 1 of 2]

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Fld. 60 [folder 2 of 2]
Fld. 61 Awards- non-NASA/JPL, 1976-1980. [folder 1 of 2]
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Fld. 64 Blamont, Jacques, 1979.
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Fld. 79 Caltech Committees, Caltech/JPL Conference on Imaging Processing, November 3-5, 1976.
Fld. 80 Caltech Committees, MIT/CIT meetings, 1977-1979.
Fld. 81 Caltech, Conference on the Next Eighty Years, 1977.
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Fld. 83 Caltech, Employee Benefits, 1976-1977.
Fld. 84 Caltech, Entertainment Account, 1979.

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Fld. 86 Caltech, Faculty, Presidential Search Committee, 1976-1977.
Fld. 87 Caltech, Fellowships, 1976-1977.
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Fld. 90 Caltech/JPL, JPL Memberships in the Athenaeum, 1976.
Fld. 91 Caltech/JPL Relationship, 1975-1979. [folder 1 of 2]
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Fld. 93 Caltech/JPL Relations, Vogt Committee on JPL/Campus Interactions, 1975.
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Fld. 103 Caltech, Staff Counsel, 1975-1977.

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Fld. 105 Caltech, Utilization of Facilities, 1976.
Fld. 106 Calio, Anthony J., 1979.
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Fld. 159 Conservation, Section 730, 1977.
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Fld. 161 Construction of Facilities, 1976-1979.
Fld. 162 Construction of Facilities, FY 1978 Seismic Protection Modifications, January 17, 1977.
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Fld. 165 [folder 3 of 3]
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Fld. 169 Contract Management, Nonprogrammatic Proposals Listing, JPL Proposals to NASA Centers and other Agencies Submitted and in Process, January 1, 1973-April 30, 1976.
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Fld. 250 ERDA, Possible Studies and Proposals, 1975-1977.
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Fld. 256 Equal Opportunity, 1975-1979.
Fld. 257 Equal Opportunity, Advisory Committee for Minority Affairs (ACMA), 1975-1979.
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Box 63 of 64 – JPL Discreet Material
JPL Discreet Material, 27 folders.

Box 64 of 64
JPL Discreet Material, 17 folders.

CATALOG DESCRIPTION

Office of the Director Collection, 1959-1982.
19.35 cu. ft. (62 boxes, 1 oversize box, and 1 small box)

The collection is composed of documents created by or sent to the Office of the Director of JPL. The three names most mentioned are William H. Pickering, Director, 1954-1976; Charles H. Terhune, Deputy Director, 1971-1983; and Bruce C. Murray, Director, 1976-1982. The diverse collection includes materials originating at JPL, NASA and Caltech, and also contains congressional records, such as witness testimonies and Congressional voting records. The bulk of the collection is dated from 1975 to 1980.

The collection is arranged by subject, and is one large subject file, documenting activities at JPL during the late 1970s. It consists primarily of correspondence, plus memoranda, published and unpublished reports, drawings, charts, presentations, handwritten notes and photographs.

The collection documents nearly every project that JPL was involved with during the time period. It includes every flight project JPL was involved with at the time, including Voyager, Viking, VOIR, ISPM, Galileo, Seasat, IRAS, Lunar Polar Orbiter and Halley's Comet missions, among others. Various energy projects, such as the study of higher fuel-efficient vehicles and the uses of solar power, and military projects, such as the MX-RES Project, are also represented in the collection.

The retirement celebrations of William Pickering and institutional briefings of Bruce Murray are documented in the collection. The interactions among Caltech, JPL, NASA and Congress are documented. Various NASA memoranda concerning JPL procedures, planning, budgets and projects are included.

Finding aid available in the repository.

Tracings
Jet Propulsion Laboratory – History

California Institute of Technology
National Aeronautics and Space Administration - History
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Friedman, Louis D.
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Project Columbus
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Groo, Elmer S.

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Search for Extraterrestrial Intelligence
Energy Research Development Administration
Solar Energy Research Institute
Solar Power
Alternate Fuels

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